# TRIPLE DIODE-TRIODE

Triple diode-triode intended for F.M. and A.M. signal detection and A.F. signal amplification.

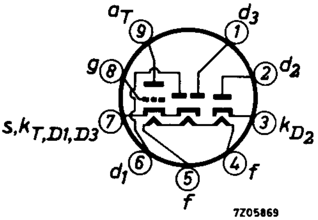
| QUICK REFERENCE DATA | | | |
|---|---|---|---|
| Triode section | | | |
| Anode current | $I_a$ | 1.0 | mA |
| Transconductance | S | 1.45 | mA/V |
| Amplification factor | $\mu$ | 70 | - |

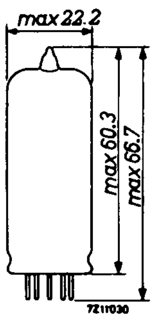
**HEATING:** Indirect by A.C. or D.C.; series supply

| | | | |
|---|---|---|---|
| Heater current | $I_f$ | 100 | mA |
| Heater voltage | $V_f$ | 28 | V |

**DIMENSIONS AND CONNECTIONS** Dimensions in mm

Base: Noval




It is recommended to connect pin 5 to earth.

## CAPACITANCES

Triode section

| | | | | |
|---|---|---|---|---|
| Grid to all except anode | $C_{g(a)}$ | | 1.9 | pF |
| Anode to all except grid | $C_{a(g)}$ | | 1.4 | pF |
| Anode to grid | $C_{ag}$ | | 2.0 | pF |
| Grid to heater | $C_{gf}$ | max. | 0.04 | pF |

Diode sections

| | | | | |
|---|---|---|---|---|
| Diode No. 1 to all | $C_{d_1}$ | | 0.8 | pF |
| Diode No. 2 to all | $C_{d_2}$ | | 4.8 | pF |
| Diode No. 3 to all | $C_{d_3}$ | | 4.8 | pF |
| Cathode ($D_2$) to all | $C_{kD_2}$ | | 5.0 | pF |
| Diode No. 1 to heater | $C_{d_1f}$ | max. | 0.25 | pF |
| Diode No. 3 to heater | $C_{d_3f}$ | max. | 0.2 | pF |
| Cathode ($D_2$) to heater | $C_{kD_2f}$ | | 2.5 | pF |

Between triode and diode sections

| | | | | |
|---|---|---|---|---|
| Anode to diode No. 1 | $C_{ad_1}$ | max. | 0.12 | pF |
| Anode to diode No. 3 | $C_{ad_3}$ | max. | 0.1 | pF |
| Anode to cathode ($D_2$) | $C_{akD_2}$ | max. | 0.01 | pF |
| Grid to diode No. 1 | $C_{gd_1}$ | max. | 0.07 | pF |
| Grid to diode No. 3 | $C_{gd_3}$ | max. | 0.02 | pF |
| Grid to cathode ($D_2$) | $C_{gkD_2}$ | max. | 0.005 | pF |

## TYPICAL CHARACTERISTICS

Triode section

| | | | | | |
|---|---|---|---|---|---|
| Anode voltage | $V_a$ | 100 | 170 | 200 | V |
| Grid voltage | $V_g$ | -1 | -1.85 | -2.3 | V |
| Anode current | $I_a$ | 0.8 | 1.0 | 1.0 | mA |
| Transconductance | S | 1.45 | 1.45 | 1.40 | mA/V |
| Amplification factor | $\mu$ | 70 | 70 | 70 | - |
| Internal resistance | $R_i$ | 48 | 48 | 50 | kΩ |

## OPERATING CHARACTERISTICS

Triode section as R.C. coupled A.F. amplifier

Grid resistor $R_g$ = 10 MΩ

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Supply voltage | $V_b$ | 200 | 200 | 200 | 170 | 170 | 170 | V |
| Anode resistor | $R_a$ | 220 | 100 | 47 | 220 | 100 | 47 | kΩ |
| Grid resistor next stage | $R_g'$ | 0.68 | 0.33 | 0.15 | 0.68 | 0.33 | 0.15 | MΩ |
| Anode current | $I_a$ | 0.56 | 1.00 | 1.60 | 0.46 | 0.82 | 1.25 | mA |
| Voltage gain | $V_o/V_i$ | 53 | 44 | 34 | 51 | 42 | 32 | - |
| Distortion: | | | | | | | | |
| at output voltage $V_o$ = 3 $V_{RMS}$ | $d_{tot}$ | 0.3 | 0.4 | 0.5 | 0.4 | 0.5 | 0.6 | % |
| at output voltage $V_o$ = 5 $V_{RMS}$ | $d_{tot}$ | 0.4 | 0.6 | 0.9 | 0.5 | 0.8 | 1.1 | % |
| at output voltage $V_o$ = 8 $V_{RMS}$ | $d_{tot}$ | 0.9 | 1.0 | 1.5 | 1.1 | 1.3 | 2.0 | % |

| | | | | | |
|---|---|---|---|---|---|
| Supply voltage | $V_b$ | 100 | 100 | 100 | V |
| Anode resistor | $R_a$ | 220 | 100 | 47 | kΩ |
| Grid resistor next stage | $R_g'$ | 0.68 | 0.33 | 0.15 | MΩ |
| Anode current | $I_a$ | 0.21 | 0.35 | 0.52 | mA |
| Voltage gain | $V_o/V_i$ | 44 | 35 | 26 | - |
| Distortion: | | | | | |
| at output voltage $V_o$ = 3 $V_{RMS}$ | $d_{tot}$ | 1.0 | 1.3 | 2.0 | % |
| at output voltage $V_o$ = 5 $V_{RMS}$ | $d_{tot}$ | 1.7 | 2.3 | 4.3 | % |

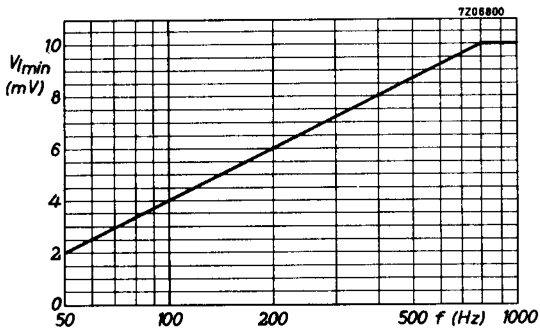
## TYPICAL CHARACTERISTICS

Diode section

| | | | |
|---|---|---|---|
| Internal resistance diode No. 1 at diode voltage $V_{d_1}$ = +10 V | $R_i\,D_1$ | 5 | kΩ |
| Internal resistance diode No. 2 at diode voltage $V_{d_2}$ = +5 V | $R_i\,D_2$ | 200 | Ω |
| Internal resistance diode No. 3 at diode voltage $V_{d_3}$ = +5 V | $R_i\,D_3$ | 200 | Ω |
| Ratio between $R_i$ ($D_2$) and $R_i$ ($D_3$) | | min. 0.67<br>max. 1.5 | |

Microphony Triode section

No special precautions against microphony are required in circuits where the input voltage is min. 10 mV for 50 mW output of the output tube at frequencies higher than 800 Hz.
At lower frequencies the sensitivity may be increased according to the figure below.



**LIMITING VALUES** (Design centre rating system)

Triode section

| | | | | |
|---|---|---|---|---|
| Anode voltage | $V_{a_o}$ | max. | 550 | V |
| | $V_a$ | max. | 250 | V |
| Anode dissipation | $W_a$ | max. | 1 | W |
| Cathode current | $I_k$ | max. | 5 | mA |
| Grid resistor | $R_g$ | max. | 3 | MΩ |
| Grid resistor at grid current bias | $R_g$ | max. | 22 | MΩ |
| Cathode to heater voltage | $V_{kf}$ | max. | 150 | V [1] |

Diode sections

| | | | | |
|---|---|---|---|---|
| Diode No.1 voltage, negative peak | $-V_{d_{1p}}$ | max. | 350 | V |
| Diode No.2 voltage, negative peak | $-V_{d_{2p}}$ | max. | 350 | V |
| Diode No.3 voltage, negative peak | $-V_{d_{3p}}$ | max. | 350 | V |
| Diode No.1 current: | | | | |
| D.C. component | $I_{d_1}$ | max. | 1 | mA |
| peak | $I_{d_{1p}}$ | max. | 6 | mA |
| Diode No.2 current: | | | | |
| D.C. component | $I_{d_2}$ | max. | 10 | mA |
| peak | $I_{d_{2p}}$ | max. | 75 | mA |
| Diode No.3 current: | | | | |
| D.C. component | $I_{d_3}$ | max. | 10 | mA |
| peak | $I_{d_{3p}}$ | max. | 75 | mA |

[1]) With regard to hum a max. AC heater to cathode voltage of 30 $V_{RMS}$ is recommended.

PHILIPS

Data handbook

Electronic components and materials

**UABC80**

| page | sheet | date |
| --- | --- | --- |
| 1 | 1 | 1969.12 |
| 2 | 2 | 1969.12 |
| 3 | 3 | 1969.12 |
| 4 | 4 | 1969.12 |
| 5 | 5 | 1969.12 |
| 6 | FP | 1999.07.29 |